

**Claims**

What is claimed:

- 1 1. A method for wirelessly transmitting data between a plurality of subscriber units
- 2 and a base transceiver station, the method comprising:
- 3 at least one subscriber unit transmitting a request to send data blocks to the base
- 4 transceiver station, the request including a data transmission queue size value;
- 5 updating at the base transceiver station, a base user queue size estimate that
- 6 corresponds to the one subscriber unit that transmitted the request to send data, the base
- 7 user queue size estimate being based upon the data transmission queue size value;
- 8 the base transceiver station generating a schedule that includes time slots and
- 9 frequency blocks in which the requested data blocks are to be transmitted from the one
- 10 subscriber unit to the base transceiver station;
- 11 the at least one subscriber unit transmitting the data blocks the at least one
- 12 subscriber unit requested to send according to the schedule, each transmitted data block
- 13 comprising encoded information representing a current data transmission queue size
- 14 value;
- 15 updating the base user queue size estimate based upon the encoded information;
- 16 and
- 17 the base user queue size estimate influencing future schedules generated by the
- 18 base transceiver station.

1 2. The method for wirelessly transmitting data between a plurality of subscriber units  
2 and a base transceiver station of claim 1, wherein:  
3 the request to send data is transmitted during a contention slot indicated within a  
4 schedule previously transmitted by the base transceiver station.

1 3. The method for wirelessly transmitting data between a plurality of subscriber units  
2 and a base transceiver station of claim 1, wherein:  
3 the data blocks comprise at least portion of a data unit, and each data unit  
4 comprises encoded information representing the current data transmission queue  
5 size value.

1 4. The method for wirelessly transmitting data between a plurality of subscriber units  
2 and a base transceiver station of claim 3, wherein the number of data units within  
3 each data block is dependent on a transmission mode.

1 5. The method for wirelessly transmitting data between a plurality of subscriber units  
2 and a base transceiver station of claim 3, wherein encoded information comprises:  
3 encoding the information within a plurality of bits within headers of the  
4 data units.

1 6. The method for wirelessly transmitting data between a plurality of subscriber units  
2 and a base transceiver station of claim 4, wherein encoding the information  
3 comprises:

4 calculating a number of data blocks to be transmitted, the number of data  
5 blocks being dependent upon the transmission mode and the current data  
6 transmission queue value.

1 7. The method for wirelessly transmitting data between a plurality of subscriber units  
2 and a base transceiver station of claim 6, wherein the number of data blocks is  
3 encoded within a plurality of bits within headers of the data units.

1 8. The method for wirelessly transmitting data between a plurality of subscriber units  
2 and a base transceiver station of claim 7, wherein a range of data blocks is encoded  
3 with the plurality of bits of headers of the data units.

1 9. The method for wirelessly transmitting data between a plurality of subscriber units  
2 and a base transceiver station of claim 8, wherein the range is determined through  
3 a look up table depending upon the number of data blocks.

1 10. The method for wirelessly transmitting data between a plurality of subscriber units  
2 and a base transceiver station of claim 6, wherein the generated schedule includes

3 a finite number of time slots that in combination form a frame, and the  
4 transmission mode can change from frame to frame.

1 11. The method for wirelessly transmitting data between a plurality of subscriber units  
2 and a base transceiver station of claim 1, wherein updating the base user queue size  
3 estimate comprises:

4 decoding received data blocks to determine the current data transmission  
5 queue value.

1 12. The method for wirelessly transmitting data between a plurality of subscriber units  
2 and a base transceiver station of claim 1, wherein updating the base user queue size  
3 estimate comprises:

4 decoding received data units to determine the current data transmission  
5 queue value, each data block comprising at least a portion of one of the data units .

1 13. The method for wirelessly transmitting data between a plurality of subscriber units  
2 and a base transceiver station of claim 12, wherein decoding received data units  
3 comprises:

4 receiving a number that represents a number of data blocks to be  
5 transferred.

1 14. The method for wirelessly transmitting data between a plurality of subscriber units  
2 and a base transceiver station of claim 12, wherein decoding received data units  
3 comprises:

4 receiving a range of data blocks;

5 determining the current data transmission queue depending upon the  
6 received range and an up-link transmission mode.

1 15. The method for wirelessly transmitting data between a plurality of subscriber units  
2 and a base transceiver station of claim 14, wherein the range is decoded from a  
3 plurality of bits located within headers of the data units.

1 16. The method for wirelessly transmitting data between a plurality of subscriber units  
2 and a base transceiver station of claim 14, wherein determining the current data  
3 transmission queue comprises:

4 estimating a level of up-link traffic;

5 determining the current data transmission queue based upon the range and  
6 the level of the up-link traffic.

1 17. The method for wirelessly transmitting data between a plurality of subscriber units  
2 and a base transceiver station of claim 1, wherein the scheduling includes  
3 generating a map, the map depicting time slots and frequency blocks that are

designated for the transmission of information between the base transceiver station and the one subscriber unit, the scheduling being influenced by the base user queue size value.

18. The method for wirelessly transmitting data between a plurality of subscriber units and a base transceiver station of claim 17, wherein the map includes down link transmission from the base transceiver station to the one subscriber unit, and up link transmission from the one subscriber unit to the base transceiver station.

19. The method for wirelessly transmitting data between a plurality of subscriber units and a base transceiver station of claim 17, wherein the map is transmitted to the plurality of subscriber units once per frame of time.

20. The method for wirelessly transmitting data between a plurality of subscriber units and a base transceiver station of claim 17, wherein the map includes time slots and frequency blocks for down link transmission from the base transceiver station to each of the plurality of subscriber units, and time slots and frequency blocks for up link transmission from each of the plurality of subscriber units to the base transceiver station.

1 21. A method for wirelessly transmitting data between a transmitter and a receiver, the  
2 method comprising:  
3 updating at the receiver, a receiver user queue size estimate that corresponds to the  
4 transmitter that transmitted a request to send data blocks, the receiver user queue size  
5 estimate being based upon a data transmission queue size value of the transmitter;  
6 the transmitter generating a schedule that includes time slots and frequency blocks  
7 in which the requested data blocks are to be transmitted from the transmitter to the  
8 receiver;  
9 the transmitter transmitting the data blocks the transmitter requested to send  
10 according to the schedule, each transmitted data block comprising encoded information  
11 representing a current data transmission queue size value;  
12 updating the receiver user queue size estimate based upon the encoded  
13 information; and  
14 the receiver user queue size estimate influencing future schedules generated by the  
15 transmitter.

1 22. The method for wirelessly transmitting data between a transmitter and a receiver,  
2 of claim 21, wherein:  
3 the data blocks comprise at least portion of a data unit, and each data unit  
4 comprises encoded information representing the current data transmission queue  
5 value.

1 23. The method for wirelessly transmitting data between a transmitter and a receiver,  
2 of claim 22, wherein the number of data units within each data block is dependent  
3 on a transmission mode.

1 24. The method for wirelessly transmitting data between a transmitter and a receiver,  
2 of claim 21, wherein encoded information comprises:  
3 encoding the information within a plurality of bits within headers of the  
4 data units.

1 25. The method for wirelessly transmitting data between a transmitter and a receiver,  
2 of claim 22, wherein encoding the information comprises:  
3 calculating a number of data blocks to be transmitted, the number of data  
4 blocks being dependent upon the transmission mode and the current data  
5 transmission queue value.

1 26. The method for wirelessly transmitting data between a transmitter and a receiver,  
2 of claim 24, wherein a range of data blocks is encoded with the plurality of bits of  
3 the headers of the data units.



1 27. The method for wirelessly transmitting data between a transmitter and a receiver,  
2 of claim 21, wherein updating the base user queue size estimate comprises:  
3 decoding received data units to determine the current data transmission  
4 queue value, each data block comprising at least a portion of one of the data units .

1 28. The method for wirelessly transmitting data between a transmitter and a receiver,  
2 of claim 27, wherein decoding received data units comprises:  
3 receiving a range of data blocks;  
4 determining the current data transmission queue depending upon the  
5 received range and an up-link transmission mode.

1 29. The method for wirelessly transmitting data between a plurality of subscriber units  
2 and a base transceiver station of claim 28, wherein determining the current data  
3 transmission queue comprises:  
4 estimating a level of up-link traffic;  
5 determining the current data transmission queue based upon the range and the level of the  
6 up-link traffic.

1 30. A method for wirelessly receiving information from a transmit unit, the method  
2 comprising:

3 receiving a request to send data blocks from the transmit unit, the request  
 4 including a data transmission queue size;  
 5 updating a user queue size based upon the data transmission queue size;  
 6 generating a schedule that includes time slots and frequency blocks in  
 7 which the requested data blocks are to be transmitted;  
 8 receiving the requested data blocks according to the schedule, each transmitted  
 9 data block comprising encoded information representing a current data transmission queue  
 10 value;  
 11 updating the user queue size estimate based upon the encoded information; and  
 12 the user queue size estimate influencing the generation of the next schedule.

1 31. The method for wirelessly receiving information from a transmit unit of claim 30,  
 2 wherein updating the base user queue size estimate comprises:  
 3 decoding received data units to determine the current data transmission  
 4 queue value, each data block comprising at least a portion of one of the data units.

1 32. The method for wirelessly receiving information from a transmit unit of claim 31,  
 2 wherein decoding received data units comprises:  
 3 receiving a range of data blocks;  
 4 determining the current data transmission queue depending upon the  
 5 received range and an up-link transmission mode.

1 33. The method for wirelessly receiving information from a transmit unit of claim 32,  
2 wherein determining the current data transmission queue comprises:  
3 estimating a level of up-link traffic;  
4 determining the current data transmission queue based upon the range and  
5 the level of the up-link traffic.

1 34. A method for wirelessly transmitting information from a transmit unit, the method  
2 comprising:  
3 the transmit unit transmitting a request to send data blocks to a receiver unit, the  
4 request including a data transmission queue size value;  
5 receiving a schedule in which the data blocks are to be transmitted;  
6 the transmit unit transmitting the requested data blocks according to the schedule,  
7 each transmitted data block comprising encoded information representing a current data  
8 transmission queue value; wherein  
9 the current data transmission queue value influences the next schedule generated  
10 by the base transceiver station.

1 35. The method for wirelessly transmitting information from a transmit unit of claim  
2 34, wherein the request to send data is transmitted during a contention slot  
3 indicated within a schedule previously transmitted by the base transceiver station.

1 36. The method for wirelessly transmitting information from a transmit unit of claim  
2 34, wherein the data blocks comprise at least portion of a data unit, and each data  
3 unit comprises encoded information representing the current data transmission  
4 queue size value.

1 37. The method for wirelessly transmitting information from a transmit unit of claim  
2 36, wherein the number of data units within each data block is dependent on a  
3 transmission mode.

1 38. The method for wirelessly transmitting information from a transmit unit of claim  
2 37, wherein encoding the information comprises:  
3 calculating a number of data blocks to be transmitted, the number of data  
4 blocks being dependent upon the transmission mode and the current data  
5 transmission queue value.

1 39. The method for wirelessly transmitting information from a transmit unit of claim  
2 38, wherein the number of data blocks is encoded within a plurality of bits within  
3 headers of the data units.

1 40. The method for wirelessly transmitting information from a transmit unit of claim  
2 39, wherein a range of data blocks is encoded with the plurality of bits of headers  
3 of the data units.

1 41. A system for wirelessly transmitting data between a plurality of subscriber units  
2 and a base transceiver station, the system comprising:  
3 at least one subscriber unit transmitting a request to send data blocks to the base  
4 transceiver station, the request including a data transmission queue size value;  
5 means for updating at the base transceiver station, a base user queue size estimate  
6 that corresponds to the one subscriber unit that transmitted the request to send data, the  
7 base user queue size estimate being based upon the data transmission queue size value;  
8 means for generating a schedule that includes time slots and frequency blocks in  
9 which the requested data blocks are to be transmitted from the one subscriber unit to the  
10 base transceiver station;  
11 the one subscriber unit transmitting the data blocks the one subscriber unit  
12 requested to send according to the schedule, each transmitted data block comprising  
13 encoded information representing a current data transmission queue size value;  
14 means for updating the base user queue size estimate based upon the encoded  
15 information; wherein  
16 the base user queue size estimate influencing future schedules generated by the  
17 base transceiver station.